



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Vol XXI
No. 3

ISSN 0019-5014

JULY-
SEPTEMBER
1966

INDIAN JOURNAL OF AGRICULTURAL ECONOMICS



INDIAN SOCIETY OF
AGRICULTURAL ECONOMICS,
BOMBAY

CHANGES IN LAND-USE PATTERN IN INDIA

R. Giri*

INTRODUCTION

For a balanced growth of agricultural economy as a whole, the successive Five-Year Plans in India contemplate augmentation of crop production as well as development of livestock and forest products. The development programmes generate competing demands on unexploited land for cultivation of crops and growth of forests and pastures. In respect of land already under use, the programmes also visualize some shifts from a less profitable use to a more profitable one. These competing demands and shifts may be absent to the extent the land is fit or earmarked exclusively for a particular utilization. But changes in the use-pattern are operative in respect of much of the other land area; and in view of the pressing need to make up the deficit in food and agricultural raw materials, changes are expected to be more in favour of cultivation than other uses.

A study of the changes in the land-use pattern in the country during the plan periods and of the associated factors may prove helpful in formulating measures to correct imbalances and to stimulate changes in desired directions. Such a study at the all-India level is attempted in the present paper. As considerable regional variations in the changes in the land-use pattern are expected, similar studies at the State level and further down at the district level may reveal conclusions which are not likely to come to light in an all-India analysis. Such studies at the lower levels may form the subject-matter of subsequent papers.

BASIC DATA FOR STUDY

The basic data for this study at the national level are presented in Appendix I which gives for the years 1950-51 to 1963-64 the break-up of the country's total "reporting" area (*i.e.*, "village paper" area for which land-use statistics are collected and reported) according to the existing land-use classification. The definitions of the different land-use categories according to the existing classification and their relationship to the old classification are explained in Appendix II.

The change-over from the old to the existing classification and the collection and compilation of land-use statistics according to the revised concepts and definitions have been introduced in different years in the different States, leading to re-classification of area from one land-use category to another.¹ At the all-India level, this affects comparison over time of area under any land-use category. The re-classification of area has, however, mostly taken place between old fallow and cultivable waste and between permanent pasture and other grazing land and area under miscellaneous tree crops and groves. Therefore, in Appendix I, the area figures of old fallow and cultivable waste land and of pasture land and miscellaneous tree crop land have been grouped together to facilitate proper trend analysis.

* The author is grateful to Dr. William E. Hendrix, Dr. V. G. Panse, Professor M. L. Dantwala and Shri J. S. Sarma for their valuable suggestions and to Shri Sham Joshi and Shri M. S. Garg for their statistical assistance. The author alone is, however, responsible for the views expressed in the paper.

1. R. Giri, "Land Records and Land Use Statistics," *Agricultural Situation in India*, Vol. XVII, No. 9, December, 1962.

CHANGE IN REPORTING AREA

The land-use statistics given in Appendix I show a rise in the "reporting" area or "village paper" area from 284.3 million hectares (mh) in 1950-51 to 300.1 mh in 1963-64, *i.e.*, by 15.8 mh. A small part of the increase in the "reporting" area is attributable to completion of cadastral survey and institution of reporting agency in the unsurveyed "non-reporting" areas in Gujarat, Uttar Pradesh, Assam, etc., which is estimated to have affected proportionately all the land-use categories except "forests" to which cadastral survey is generally not extended.

The bulk of the increase in the "reporting area" appears to have taken place as a result of reconciliation of forest area according to "village papers" with that according to "forest returns." From time to time, the Ministry of Food, Agriculture, Community Development and Co-operation have suggested to the States measures to reconcile the difference between the two sets of figures of forest area by relating them to the same coverage and to the same definition. As a result of the efforts made by them for this reconciliation, the forest area according to "village papers" (published in Indian Agricultural Statistics) increased by 15.3 mh from 40.5 mh in 1950-51 to 55.8 mh in 1963-64. However, the forest area according to "Forest Returns" (published in Indian Forest Statistics) declined by 2.7 mh from 71.8 mh in 1950-51 to 69.1 mh in 1962-63.² The difference in the forest areas according to the two sources was of the order of 31.3 mh in 1950-51 and it narrowed down to 13.3 mh in 1963-64 (Appendix III). The forest area according to the village papers has, year after year, come closer to that according to the forest returns which are supposed to be more complete in respect of the forest area.³ The increase of 15.3 mh in the forest area according to the village papers thus appears to be due to the increase in the "reporting area" as a result of efforts made to reconcile the forest areas according to the two sources, *viz.*, "village papers" and "forest returns."

Even the decline of 2.7 mh in the forest area according to the "forest returns" is not entirely real. About 2.2 mh of this decline is accounted for by statistical adjustment made in some States in the area according to forest returns also, in order to reconcile it with the forest area according to village papers.

CHANGES IN LAND-USE PATTERN IN 1963-64 OVER 1950-51

The real fall in the forest area is thus estimated at about 0.5 mh only, and is ascribable to deforestation for cultivation and small as well as big settlements like Dandakaranya.

As regards other land-use categories,⁴ it will be seen from Appendix I that in 1963-64 compared to 1950-51, the net area sown increased by 17.5 mh, the current fallow by 0.4 mh and the land under non-agricultural uses by 3.3 mh, followed by a fall of 0.5 mh in barren and uncultivable land, 12.4 mh in old fallow and

2. Figure of forest area in India according to Indian Forest Statistics is not available for 1963-64. It is, however, expected to be not appreciably different from that in 1962-63.

3. R. Giri, "Reconciliation of Forest Areas published in Indian Agricultural Statistics and Indian Forest Statistics," *Agricultural Situation in India*, Vol. XX, No. 12, March, 1966.

4. The effect of change in "reporting area" on the other categories has been seen to be small and proportionately distributed and hence no allowance in their areas is made for this change.

culturable waste, and 7.8 mh in pasture and other grazing land and miscellaneous tree crop land.

In spite of the emphasis on developing forests and pastures, besides augmenting crop production, the forest area and the area available for use as pasture and grazing land have actually declined and the decrease is sizable in the case of the latter. The more intense and urgent demand of land for crop production has not only hampered expansion of forest and pasture land, but has also led to encroachment on them. Programmes for development of forestry have thus to be oriented more towards qualitative improvements of the forests. Development of pasture has also to be achieved mainly by improving the existing pasture and grazing lands, both within and outside the forests and miscellaneous tree crops and groves.

The largest increase in the net area sown has been contributed by the old fallow and culturable waste land. It is revealing that even what is classed as barren and unculturable land has been brought into use to the extent of 0.5 mh. These three land-use categories constitute the area which is not put to any use. The fall in this area and its utilization is an encouraging feature. But increase in current fallow is a disturbing feature. There has also been sizable increase in the area of the land under non-agricultural uses as a result of construction of houses, factories, irrigation works, etc., and, to some extent, this increase has involved encroachment on arable land. At this stage an analysis of the changes in the land-use pattern over the plan periods may be more revealing.

CHANGES OVER PLAN PERIODS

The relevant data for a study of the changes in the land-use pattern over the plan periods are summed up in Table I.

TABLE I—VARIATION IN AREAS OF DIFFERENT LAND-USES OVER PLAN PERIODS

Land-use category	[area in million hectares (mh)]			
	Increase (+) or Decrease (—) during			
	First Plan (1955-56 minus 1950-51)	Second Plan (1960-61 minus 1955-56)	Three years of Third Plan (1963-64 minus 1960-61)	Whole period (1963-64 minus 1950-51)
1. Forests	+3.2	—2.6	—1.1	—0.5
2. Barren and unculturable land ..	—1.5	+0.8	+0.2	—0.5
3. Land under non-agricultural uses ..	+2.1	+1.0	+0.2	+3.3
4. Old fallow and culturable waste land ..	—6.4	—3.8	—2.2	—12.4
5. Permanent pasture and other grazing land and miscellaneous tree crops and groves	—9.1	+0.8	+0.5	—7.8
6. Current fallow	+1.2	—0.1	—0.7	+0.4
7. Net area sown	+10.5	+3.9	+3.1	+17.5

About two-third of the total increase in the net area sown during the 13-year period, 1950-51 to 1963-64, has materialised during the First Plan. All the reclamation, for cultivation, of barren and unculturable land and pasture and miscellaneous tree crop land and more than half of the reclamation of old fallow and culturable waste land have taken place in the First Plan. A small part of the loss in pasture and miscellaneous tree crop land has been made up in the subsequent two plans. The initial tempo of increasing crop production by extending cultivation to easily reclaimable land seems to have been curbed in the Second and the Third Plan to avoid encroachment on pasture and grazing lands which are equally important for livestock development. The decreasing rate of reduction in old fallow and culturable waste land from plan to plan also bears testimony to diminishing efforts towards ploughing up arable land as the chief measure to augment crop production.

In the First Plan, the increase in agricultural production was sought to be achieved mainly through the easier method of extending cultivation. The CTO and STO played a big role in reclaiming new areas for cultivation. The extension of cultivation to the remaining arable land in the subsequent plans was comparatively difficult, and was conditioned by extension of irrigation facilities, land development and soil conservation measures. In the subsequent plans, the emphasis had to be in increasing cropping intensity and yield-rate through irrigation, land development and use of fertilizers and other superior inputs. This explains for larger increase in net area sown in the First Plan, but smaller increase in the Second and the Third Plan. This is corroborated by the fact that the index numbers of area under crops in India (which allow for the statistical changes) increased (over 1949-50=100) by 15 per cent in the First Plan, but by another 7.9 per cent only in the subsequent 8 years upto 1963-64.⁵

Plan efforts were mainly responsible for land-use shifts in favour of net sown area, although the effect of general economic climate cannot be denied. The rise in prices of agricultural commodities during and after the Korean War stimulated efforts for increased agricultural production which were directed more towards extension of cultivation in the First Plan; in the subsequent plans, the effect of favourable prices had to be reflected more in increased intensive cultivation and shifts from low value crops to high value crops.

The current fallow increased during the First Plan and declined at an increasing rate during the Second and the Third Plan. The need for keeping a large extent of current or resting fallow during the First Plan emerged as a natural corollary of sizable extension of cultivation to all kinds of arable land including land of low productivity, without being adequately supported by fertility sustaining measures like application of fertilizers, land development and soil conservation. With the slowing down or arresting of the decline in old fallow and culturable waste land, pasture and miscellaneous tree crop land, and barren and unculturable land, the need for keeping resting fallow was felt to a smaller extent during the Second and the Third Plan leading to a decline in current fallow at a rising rate.

The forest area showed a substantial rise in the First Plan; but a fall, though at a declining rate, during the Second and the Third Plan, partly as a result of pro-

5. Growth Rates in Agriculture, 1949-50 to 1964-65, Economic and Statistical Adviser, Ministry of Food and Agriculture, Government of India, New Delhi, March, 1966.

grammes for colonization and settlements in the forests. Submersion of forest area under reservoirs, etc., might have also accounted for some fall in the forest area.

With the construction of houses, roads and railways, workshops and factories, dams and reservoirs, canals and waterways, etc., as a result of rising population, increasing urbanization, industrial growth and irrigational development, the land under non-agricultural uses increased at a sharp rate during the First Plan, at a less rapid rate during the Second Plan and at a slow rate during the Third Plan. So far as the increase in land under non-agricultural uses involved encroachment on arable land, it limited the scope for extension of cultivation or pasture, etc.

ASSOCIATED FACTORS

Some factors motivating changes in land-use pattern were mentioned while examining the extent of these changes in the preceding sections. A closer examination of the factors associated with the extension of cultivation which has resulted from ploughing up of fallows, culturable waste, pasture and miscellaneous tree crop groves, etc., would be useful.

Reduction in fallows takes place as a result of land development and soil conservation measures, rationalization of crop rotation and use of irrigation and fertilizers to restore soil fertility without keeping current or long fallows. Abolition of non-cultivating ownership and improvement in economic condition of the farmers or extension of credit facilities to enable them to make investment for developing fallows are other factors inducing ploughing up of fallows. Extension of cultivation to culturable waste, pasture, miscellaneous tree crop land, etc., is made possible through land reclamation and land development measures and extension of irrigation.

Precise assessment of the contribution of the different factors in extending cultivation is made difficult owing to paucity of data on these aspects.⁶ Irrigation is, however, generally a concomitant of many other factors. Use of fertilizers as a means to rationalizing crop rotation and building up of soil fertility so as to reduce fallows, is ruled out without irrigation unless retention or supply of moisture in the land is assured through bunding or ample and timely rainfall. In the absence of adequate and evenly distributed rainfall, continued cultivation of waste land, pasture and miscellaneous tree crop land also becomes difficult without irrigation. It would, therefore, be interesting to analyse how far irrigation is associated with the increase in sown area.

For an assessment of the contribution of irrigation to extension of cultivation, a comparison of increases in net sown area and net irrigated area in the different plan periods is given in Table II. A part of the increase in net irrigated area is achieved by extending irrigation to the area which was cropped previously, but was not irrigated. The net sown area in India is generally two-third of the total arable land (which comprises, in addition, fallow, culturable waste, pasture and miscellaneous tree crop groves). Two-third of the increase in the net irrigated area may thus be assumed to be originating from the area already sown and the

6. A quantitative assessment of the contribution of the various factors to extension of cultivation may be attempted through the production function approach.

remaining one-third from the newly reclaimed and sown land. The figures in the table for irrigated area are given with this bifurcation.

TABLE II—INCREASES IN NET IRRIGATED AREA AND NET SOWN AREA OVER THE PLAN PERIODS

Description of area	[area in million hectares (mh)]			
	Increase during			
	First Plan	Second Plan	Three years of Third Plan	Whole period
(1)	(2)	(3)	(4)	(5)
1. Net irrigated area :				
(a) in existing cropped area	1.3	1.2	1.0	3.5
(b) in newly cropped area	0.6	0.6	0.5	1.7
Total	1.9	1.8	1.5	5.2
2. Net sown area	10.5	3.9	3.1	17.5

During the whole period under study, the net irrigated area increased by 5.2 mh. Out of this, it is estimated that only 1.7 mh was accounted for by extension of irrigation to newly cropped land. The balance of 15.8 mh of the total increase of 17.5 mh in net sown area was thus due to land development, soil conservation, and land reclamation measures without irrigation. For moisture, this area had to depend on rainfall and such land development and crop rotation measures which helped retention of adequate moisture for cultivation.

Plan-wise analysis of the above figures, however, reveals increasing role of irrigation in extension of cultivation. In the First Plan, less than 6 per cent (0.6mh) of the additional area sown (10.5 mh) was irrigated. The increase in the net area sown in the Second and the Third Plan was not so pronounced as in the First Plan, but irrigation continued to be extended at a steady, though low, rate and was an important factor in bringing new land under cultivation during the Second and the Third Plan. The proportion of irrigated area in the new area brought under plough rose to more than 15 per cent in the Second Plan and 19 per cent in the Third Plan.

In spite of decline in the current fallow in the Second and the Third Plan, in 1963-64 the area under current fallow was still larger than in 1950-51 and was over 8 per cent of the net area sown. The rate of decline in old fallow and culturable waste achieved during the First Plan, had slowed down during the Second and the Third Plan, and in 1963-64 their area was still over 20 per cent of the net area sown. Much of the barren and unculturable land reclaimed during the First Plan was reverted to its old status during the Second and the Third Plan. In 1963-64 such land was more than 26 per cent of the net area sown. In all, these three types of land added up to 54 per cent of the net area sown in 1963-64. Even assuming that only one-fourth of this aggregate area can be kept in use on a continuing basis, scope for further exploitation of arable area is by no means small. A detailed survey needs to be carried out in respect of such lands to assess their potential use for cultivation and for other uses, e.g., raising forests and livestock

by ascertaining their location, size, cost and method of reclamation, etc.⁷ The foregoing analysis of the trends in the changes in land-use pattern, however, clearly brings out that such lands cannot be reclaimed for cultivation on a continuing basis to an appreciable extent, unless the reclamations are supported by measures which build and sustain soil fertility. These measures are land development, soil conservation, irrigation and increased fertilizer use. Extension of actual irrigation during the plan periods is by no standard impressive; and it will be difficult to reverse the diminishing rate of decline in unexploited arable land observed during the Second and the Third Plan, without massive efforts in respect of land development, irrigation (which may be under minor and medium, and not necessarily major projects) and fertilizer application.

Land development, irrigation and fertilizer use contribute not only towards increasing sown area, but towards introducing more rational and intensive cropping pattern and improving yield-rates. But a study of those aspects is outside the purview of the present paper.

SUMMARY

During the 13-year period, 1950-51 to 1963-64 comprising the first two plan periods and the first three years of the Third Plan, the net area sown increased by 17.5 mh or 14.7 per cent, the current fallow by 0.4 mh or 3.7 per cent and the area under non-agricultural uses by 3.3 mh or 29.5 per cent, followed by decreases of 0.5 mh or 0.7 per cent in forest area, 0.5 mh or 1.4 per cent in barren and unculturable land, 12.4 mh or 30.7 per cent in old fallow and culturable waste land and 7.8 mh or 29.4 per cent in pasture and miscellaneous tree crop land. Analysing plan-wise, it is seen that during the Second and the Third Plan, the increases in net area and area under non-agricultural uses progressively slowed down; barren and unculturable land and pasture and miscellaneous tree crop land started rising, though at a falling rate; decline in the old fallow and culturable waste land became less steep; and the forest area which increased in the First Plan, showed signs of decline.

Irrigation to newly cropped land was extended to roughly 0.6 mh in each plan period, *i.e.*, 1.7 mh only out of the total additional area of 17.5 mh brought under plough during the entire period under study. The remaining 15.8 mh of additional area was sown mainly as a result of land reclamation and development measures without the aid of irrigation. The available unused arable lands still provide ample scope for cultivation and other utilizations, but increased use of irrigation, land development and fertilizers would be necessary to reverse the unsatisfactory trends observed during the Second and the Third Plan with regard to these lands.

Forests and pastures need to be preserved, but their development in future may have to depend more on qualitative improvement than on expansion of their area.

The increase in area under non-agricultural uses has involved encroachment on arable land which could be checked to some extent by confining, as far as possible, construction programmes to barren and unculturable land.

7. V. G. Panse, "Statistics of Land and Its Productivity for Agricultural Planning," Paper presented at the Seminar on Agricultural Planning at Matheran, October, 1964.

APPENDIX I

TRENDS IN LAND-USE PATTERN IN INDIA, 1950-51 TO 1963-64

Year	Total reporting area	(1) Forests	(2) Barren and unculturable land	(3) Land under non-agricultural uses	(4) Old fallow and (5) Culturable waste	(6) Permanent pasture and other grazing land and (7) Miscellaneous tree crops and groves	(8) Current fallow	(9) Net area sown
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1950-51	284.3	40.5	36.3	11.2	40.4	26.5	10.7	118.7
1951-52	287.8	48.9	37.4	12.7	39.1	16.5	13.8	119.4
1952-53	290.8	51.2	37.4	12.3	37.2	16.4	12.9	123.4
1953-54	291.9	51.1	36.4	13.3	35.6	16.7	12.0	126.8
1954-55	291.4	50.4	35.2	13.3	35.8	17.0	11.9	127.8
1955-56	291.9	51.3	34.8	13.3	34.0	17.4	11.9	129.2
1956-57	292.2	51.4	33.7	13.4	33.2	18.0	11.7	130.8
1957-58	293.4	52.2	33.6	13.4	33.2	18.9	13.0	129.1
1958-59	293.7	51.4	32.9	14.1	32.5	19.1	11.9	131.8
1959-60	297.3	54.0	33.8	14.3	31.4	19.5	11.4	132.9
1960-61	298.9	55.7	35.6	14.3	30.2	18.2	11.8	133.1
1961-62	299.3	54.5	35.7	14.8	29.1	18.6	11.2	135.4
1962-63	299.9	55.5	35.2	15.1	28.2	18.7	11.0	136.2
1963-64	300.1	55.8	35.8	14.5	28.0	18.7	11.1	136.2

Source : Indian Agricultural Statistics, Vol. I, published by the Directorate of Economics and Statistics, Ministry of Food, Agriculture, Community Development and Co-operation, Government of India.

APPENDIX II

DEFINITIONS OF DIFFERENT LAND-USE CATEGORIES ACCORDING TO EXISTING CLASSIFICATION AND THEIR RELATIONSHIP TO OLD CLASSIFICATION

Old classification	New classification	Definition of the new classification
1. Forests	1. Forests	Area under forests includes all lands classed as forests under any legal enactment dealing with forests or administered as forests, whether State-owned or private, and whether wooded or maintained as potential forest land.
2. Area not available for cultivation	2. Land under non-agricultural uses	This stands for all lands occupied by buildings, roads and railways or under water, <i>e.g.</i> , rivers, and canals and other lands put to uses other than agricultural.
	3. Barren and unculturable land	This covers all barren and unculturable lands like mountains, deserts, etc. Land which cannot be brought under cultivation unless at a high cost is classed as unculturable, whether such land is in isolated blocks or within cultivated holdings.
3. Other uncultivated land excluding fallows	4. Permanent pastures and other grazing lands	These cover all grazing lands, whether they are permanent pastures and meadows or not. Village common grazing lands are included under this head.
	5. Miscellaneous tree crops and groves not included in the net area sown	Under this class is included all cultivable land which is not included under "net area sown" but is put to some agricultural use. Lands under Casurine trees, thatching grasses, bamboo bushes and other groves, for fuel, etc., which are not included under orchards, shall be classed under this category.
	6. Culturable waste	These include all lands available for cultivation whether not taken up for cultivation or taken up for cultivation once, but not cultivated during the current year and last five years or more in succession.
4. Fallows	7. Fallow land other than current fallows	This includes all lands which were taken up for cultivation for a period of not less than one year and not more than five years. The reasons for keeping such lands fallow may be one of the following: (1) poverty of cultivators, (2) inadequate supply of water, (3) malarial climate, (4) silting of canals and rivers and (5) unremunerative nature of farming.
	8. Current fallow	This class comprises of cultivated areas which are kept fallow during the current year. If any seedling area is not cropped again in the same year it may be treated as current fallow.
5. Net area sown	9. Net area sown	This consists of net area sown with crops and orchards.

APPENDIX III

DIFFERENCE IN FOREST AREA IN INDIA ACCORDING TO "VILLAGE PAPERS" AND "FOREST RETURNS"

[area in million hectares (mh)]

Year	Area under forests according to		Difference (3)—(2)
	Village Papers	Forest Returns	
(1)	(2)	(3)	(4)
1950-51	40.5	71.8	31.3
1951-52	48.9	73.4	24.5
1952-53	51.2	72.7	21.5
1953-54	51.1	72.7	21.6
1954-55	50.4	72.2	21.8
1955-56	51.3	70.4	19.1
1956-57	51.4	70.6	19.2
1957-58	52.2	71.1	18.9
1958-59	51.4	69.6	18.2
1959-60	54.0	69.2	15.2
1960-61	55.7	69.0	13.3
1961-62	55.9	69.3	13.4
1962-63	55.5	69.1	13.6
1963-64	55.8	69.1*	13.3

* 1962-63 figure repeated.

Sources: Indian Agricultural Statistics, Vol. I and Indian Forest Statistics published by the Directorate of Economics and Statistics, Ministry of Food, Agriculture, Community Development and Co-operation, Government of India.